The effect of Sharia monetary policy instruments and Islamic bank financing on economic growth and inflation

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Abstract

Purpose – This study aims to determine the influence of Open Market Operations (Sertifikat Bank Indonesia Syariah, SBIS), Sukuk of Bank Indonesia (Sukuk Bank Indonesia, SukBI), Bank Indonesia Sharia Deposit Facility (Fasilitas Simpanan Bank Indonesia, FASBIS), Islamic Interbank Money Market (IIMM/Pasar Uang Antar Bank Syariah, PUAS), and Islamic Bank Financing on economic growth and inflation in Indonesia.

Methodology – This study uses the Vector Error Correction Model (VECM), which uses monthly data from January 2017 to December 2022.

Findings – The results of the VECM analysis show that, in the short and long term, the FASBIS and PUAS variables significantly affect economic growth. The Covid-19 pandemic has a significant effect in the short term, whereas Islamic Bank Financing has a significant effect in the long term. In the Inflation model, only FASBIS has a significant short-term effect. In the long-term, FASBIS, PUAS, and Islamic Bank Financing significantly affect inflation.

Implications – The results of this research suggest that the Government and Bank Indonesia will need to re-evaluate Sharia Open Market Operations, especially SBIS and SukBI instruments. This is the impact of the estimation results on the Open Market Operation variable, which are not significant, and the IRF results, which are negative in the Economic Growth Model and positive in the Inflation Model, indicating that the Open Market Operation variable actually inhibits economic growth and triggers inflation.

Originality – This study discusses the influence of Sharia monetary instruments before and after the Covid-19 pandemic and adds the SukBI instrument as a Sharia monetary instrument.

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Introduction

Monetary policies play an important role in a country's economy. A central bank implements a monetary policy to influence real economic activity and prices by using certain transmission mechanisms (Ascarya, 2012). The monetary policy transmission mechanism reflects how the central bank's monetary policy actions can impact various aspects of economic and financial activities, with the ultimate aim of achieving predetermined targets (Bernanke & Getler, 1995). The interaction between monetary policy and the real economy can be seen through the influence of monetary transmission channels on various macroeconomic variables, especially economic growth, inflation, and investment (Hamza & Saadaoui, 2017). Thus, the implementation of an appropriate

monetary policy results in the creation of stable prices and increased economic growth. Therefore, the central bank must carefully consider an appropriate and targeted monetary policy.

Bank Indonesia, as the central bank, is authorized to implement monetary policy in Indonesia. So, Bank Indonesia, as the implementer of monetary policy in Indonesia, needs to carry out its duties well so that the goal of maintaining the stability of the value of the rupiah. As a country that implements a dual banking system, Indonesia operates Sharia and conventional banking systems side-by-side based on the 1998 Banking Law (Hafidh, 2021). Therefore, Indonesia implements Sharia and conventional monetary policies.

In August 2016, Indonesia's benchmark policy interest rate used the BI seven-day reverse repo rate as a replacement for the Bank Indonesia Certificate (also known as the BI rate) (Handayani & Kacaribu, 2021). This replacement aims to shorten the transmission of policy interest rates to the money market, banking, and real sector (Warjiyo & Juhro, 2019) 7DRR Day Reverse Repo Rate (BI7DRR) interest rate instrument to control economic activities to control inflation. The transmission of the BI7DRR determination will have an impact on various instruments. One of the instruments affected is the development of short-term interest rates, namely the Interbank Money Market (PUAB) (Bank Indonesia, 2023). Therefore, Bank Indonesia needs to adjust its PUAB interest rate so that it does not deviate too far from BI7DRR through monetary operations.

Bank Indonesia also carried out Sharia Monetary Operations (OMS) to achieve monetary stability. OMS are carried out by holding Open Market Operations (OMO) and standing facilities that comply with Sharia provisions. Open Market Operations use the Bank Indonesia Sharia Certificate (SBIS) and Bank Indonesia Sukuk (SukBI) instruments, as well as various transactions in the rupiah and foreign exchange money markets, such as securities transactions and futures placements that comply with sharia provisions. The instruments used are standing facilities sharia, including the Bank Indonesia Sharia Deposit Facility (FASBIS), as well as Sharia financing through repo and collateral in the form of securities (Bank Indonesia, 2023).

Indonesia has great potential in terms of its Sharia financial system. This is demonstrated by Indonesia's achievements, namely, achieving first place in the 2021 Islamic Finance Country Index (IFCI) (Bank Indonesia, 2021) and second place in the 2021 Islamic Finance Development Indicator (IFDI) in a report from Refinitv (DataIndonesia, 2021). As a part of the Sharia financial system, Sharia banking plays an important role in monetary policy. Sharia banking acts as a financial intermediary that collects funds from customers and distributes them to the community. If the financial services sector increases, economic performance, as indicated by the Gross Domestic Product (GDP), will also increase (Silva et al., 2021; Swamy & Dharani, 2021).

The credit banking sector is one channel that is considered effective in transmitting monetary policy to the economy (Fikri, 2019). Bank credit lines are still effectively used in monetary transmission mechanisms in countries in which banks and companies have limited direct access to financial markets (Peek & Rosengren, 2013). Sharia monetary operations are an example of a mechanism that describes the transmission of Bank Indonesia's monetary policy through changes in monetary instruments to achieve the operational targets of monetary operations, namely economic growth and inflation.

The economic sector was severely affected by the Covid-19 pandemic. Padhan and Prabheesh (2021) conducted a literature survey on the various impacts of the COVID-19 pandemic, including stock markets, exchange rates, and oil prices. Several studies have shown the pandemic's influence on financial markets and the real economy (Goldstein et al., 2021). Wei and Han (2021) show that the pandemic has significantly weakened the transmission of monetary policy to financial markets. In India, the pandemic has harmed economic growth, trade manufacturing, and the micro, small, and medium enterprise (MSME) sector (Sahoo & Ashwani, 2020).

An effective monetary policy can be seen from its effect on controlling inflation and the real sector, namely, economic output. The monetary policy target in the form of inflation rate is mentioned indirectly through Law No. 3 of 2004 (Warjiyo, 2004). Indicators can be used to see economic growth or output, namely the growth of Gross Domestic Product (GDP) (Wibowo & Mubarak, 2017). Monthly economic growth can be observed through the Industrial Production Index (IPI) indicator (Syapriatama, 2017).

Indonesia's economic growth in the last decade, from 2012 to 2022, has experienced slow declines and increases. An extreme decline in economic growth occurred in 2020. This decline was the result of the Covid-19 pandemic, which has caused sluggish economic activity in Indonesia. The positive figure was reached again the following year, reaching a positive figure of 3.7 percent when Indonesia passed the delta variant wave in July-August 2021.
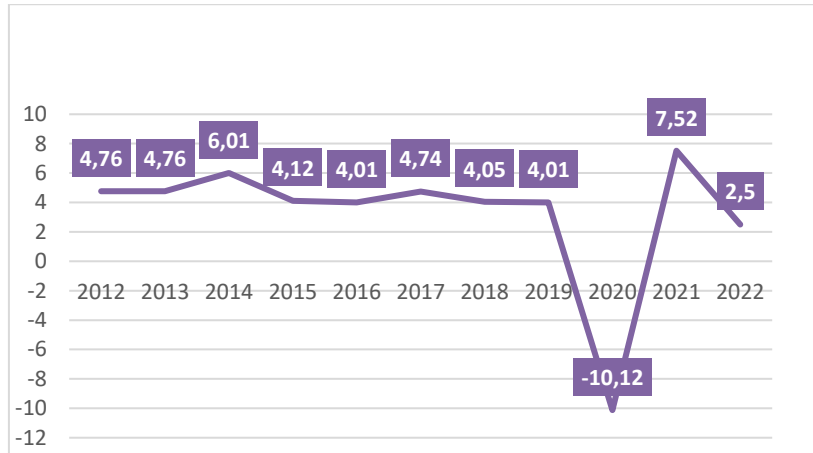
Source: Badan Pusat Statistik (BPS), 2023)

Figure 1. Growth Rate of Industrial Production Index (IPI) for medium and large scale manufacturing in 2012-2022

The sluggish economic activity in Indonesia impacts not only the growth rate of gross domestic products, but also the manufacturing and industrial sectors. The growth rates of medium- and large-scale manufacturing industries are shown in Figure 1. In 2020, the growth of medium- and large-scale manufacturing industries experienced a contraction of 10.12 percent (yoy). This is important, because the manufacturing industry is a leading sector with a large contribution to Indonesia's GDP. According to the Central Bureau of Statistics (Badan Pusat Statistik, BPS, 2020), the manufacturing industry accounted for 19.70% in 2019 and 20.79 % %in 2020.
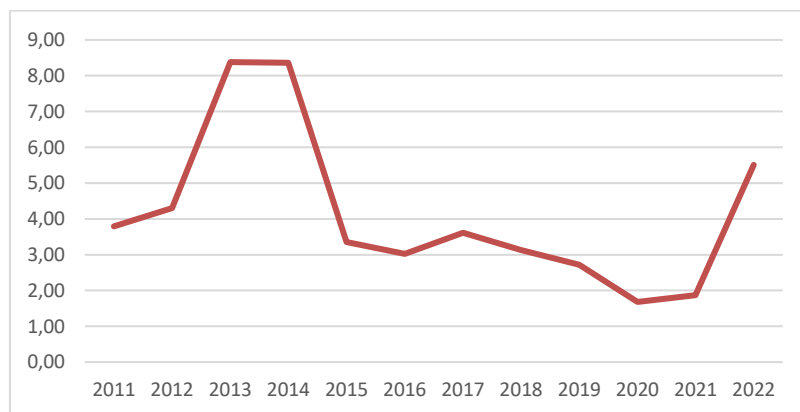
Source: Statistical Economics and Finance of Indonesia– BI, 2021

Figure 2. Indonesia's Inflation Rate 2011-2022

Figure 2 shows that the inflation rate in Indonesia has experienced instability over the past decade. This condition is shown through the inflation rate data for 2011-2022 recorded by the SEKI-BI. These data show that inflation in Indonesia experienced an extreme increase in the inflation rate in 2013. Indonesia's inflation rate also experienced an extreme decrease in 2015. Finally, it will experience an extreme increase again in 2022 at 5.51 percent.

Indonesia's monthly inflation has experienced fluctuations during the last two years. In September 2021, Indonesia's monthly inflation rate declined sharply from 1.59 percent in August

2021 to 0.16 percent. Indonesia's monthly inflation rate will continue to increase to 5.95 percent in September 2022. According to the World Bank (2022), the increase in the inflation rate in Indonesia is due to the world economy experiencing pressure as a result of Russia's invasion of Ukraine in February 2022. The impact of conditions These include an increase in global oil prices from an average of USD 70 per barrel in 2021 to more than USD 100 since the end of February 2022 (World Bank, 2022). The rising world oil prices have resulted in increased inflation rates in Indonesia. Food commodity prices have increased because of the increase in input prices due to increases in oil prices. This is reflected in the main consumer price index (CPI) inflation, which rose significantly from an average of 1.6 percent in 2021 to 3.5 percent (yoy) in April 2022 (World Bank, 2022).

Conventional monetary operations still dominate over Sharia monetary operations in controlling inflation and output levels in Indonesia. Several studies show that monetary policy, especially the Sharia monetary policy, impacts inflation and economic growth. Research from Ascarya (2012) shows that conventional monetary instruments have a negative impact on economic growth and inflation, while Sharia monetary instruments have a positive impact on economic growth and inflation. While Sharia monetary instruments help suppress inflation and stimulate economic growth, conventional monetary instruments encourage inflation and economic growth stagnation. Dwihapsari et al. (2021) stated in their research that inflation can be stabilized through Sharia monetary policy with a larger magnitude than conventional monetary policy, but it takes longer than conventional monetary policy. Similar results are also shown by researchby Aqidah et al. (2022), which states that when compared with conventional instrument variable indicators, Sharia instrument variable indicators have a greater impact on inflation, as proven through Variance Decomposition.

Research from Hamza and Saadaoui (2017) show through the VAR method and panel regression that the existence of a monetary policy debt financing channel due to variations in interest rates affects Islamic bank financing in Turkey, making the growth of Profit-Sharing Investment Accounts (PSIA), capitalization, liquidity, and asset size one of the main determinants of the supply of Islamic bank debt assets. In addition, several robustness tests show that the growth of PSIA significantly reduces the negative effect of interest rates on the growth of debt financing. Therefore, it can be concluded that although the influence of the Islamic monetary system is still relatively small compared to the conventional system in transmitting monetary policy to the real sector, the Islamic system can reduce the negative impact of interest rates so as not to cause inflation or increase economic growth.

Previous research shows that Sharia monetary policy shows more satisfactory results in controlling the level of inflation and output in Indonesia. However, this study has not added the impact of the Covid-19 pandemic on economic growth and inflation in Indonesia. Therefore, this topic is interesting for reexamination.

Literature Review

Sharia Monetary Operations are conducted so that the rupiah and foreign exchange money markets have sufficient liquidity. To achieve this, Bank Indonesia must reduce and increase liquidity according to liquidity conditions. Sharia Monetary Operations are carried out in two forms: Sharia Open Market Operations (OMO) and Sharia Standing Facilities. Sharia OMO is performed using instruments such as the SBIS and/or SukBI. Sharia Standing Facilities include using an instrument in the form of FASBIS as a mechanism for Bank Indonesia to accept the placement of rupiah funds (deposit facility). Bank Indonesia uses the Sharia Interbank Money Market (PUAS) to support monetary operations and maintain Islamic banking liquidity. Financing is an intermediary target of monetary operations (Madani & Widiastuti, 2021). Financing is one channel considered effective in transmitting monetary policy to the real economy. Bank lending channel theory relies on the fundamental assumption that tightening or loosening monetary policy has a significant impact on the supply of bank loans. An expansionary monetary policy results in an increase in bank reserves and deposits, which consequently results in an increase in the amount of credit available to customers. In the case of a tightening monetary policy, the opposite effect occurs, resulting in a reduction in the amount of credit available to customers (Rafay & Farid, 2019). Financing is aimed

at additional liquidity in the economy with the hope that the ultimate goal of monetary operations is to achieve economic growth. Islamic banking aggregate financing is financed by Sharia Commercial Banks and Sharia Business Units, which are distributed to the community to finance real sector activities. This will then increase community productivity by increasing the production of goods and services, increasing community income, and continuing economic growth (Madani & Widiastuti, 2021).

Several previous studies have examined monetary transmission mechanisms, especially the role of Sharia banking. Ascarya (2012), Fikri (2018), Hafidh (2021), and Madani and Widiastuti (2021) examine the monetary transmission mechanism for case studies in Indonesia. Ascarya (2012) states that fluctuations in SBIS, PUAS, profit-sharing, and Sharia financing have a permanent and positive impact on economic growth and inflation. Through the Granger causality test, Sharia instruments, which are profit-loss sharing (PLS)-based financing, such as *mudharabah* and *musyarakah*, have a positive effect on real economic output and have no impact on inflation. Based on the results of Fikri's research (2019), monetary policy stimulates economic growth by providing credit and financing but is not effective in stabilizing the inflation rate. Research by Hafidh (2021) also shows that Sharia monetary variables have only a small impact. Research conducted by Madani and Widiastuti (2021) shows that Sharia monetary variables, consisting of FASBIS, PUAS, and Sharia Financing, affect GDP as a proxy for economic growth. Therefore, in general, the Sharia monetary transmission mechanism through the role of Sharia banking has a positive influence on economic growth, but is ineffective in controlling inflation.

Malaysia and Pakistan are examples of countries that have implemented dual-banking systems. Several studies have examined monetary transmission mechanisms through the role of Islamic Banking. Previous research has found evidence of the existence of a credit supply channel in monetary policy through Islamic banks and its impact on the economies of Malaysia (Shah & Rashid, 2019; Caporale et al., 2020) and Pakistan (Ali et al., 2022; Rafay & Farid, 2018). Caporale et al. (2020) show that Islamic credit is less responsive to interest rate shocks than conventional credit in both high- and low-growth regimes. However, shocks to Islamic credit encourage output growth under low-growth regimes. Research results from Audah and Kasri (2020) show that Islamic bank savings and financing play an important role in channeling monetary policy to the Malaysian economy, even at a medium level. In terms of a comparison between Malaysia and Pakistan, Shah and Rashid (2019) stated that Islamic banks in Malaysia are more responsive to monetary policy actions than in Pakistan. Ali et al. (2022) show a positive relationship between bank deposits in Pakistan's Islamic banks and economic output. Even research from Hamza and Saadaoui (2017), who used a sample of 50 Islamic banks from 10 countries, confirmed the existence of debt financing channels in monetary policy.

In economic conditions that are running too strong and causing inflation, contractionary policies are implemented with the aim of reducing Money Supply (JUB). The reduction in JUB is expected to reduce the inflation rate by reducing public demand for goods, which is the cause of demand-pull inflation (Rahardja & Manurung, 2004). The Open Market Operations referred to in this research consist of two variables: SBIS and SukBI Sukuk. The SBIS is a Sharia monetary instrument used by Bank Indonesia to maintain and regulate the amount of money circulating in the banking sector. When Bank Indonesia increases its SBIS yields, banks tend to place excess liquidity in SBIS. On the other hand, when Bank Indonesia reduces SBIS yields, banks tend to increase the amount of financing to the public, which then increases business activities in the real sector and economic growth. An increase in SBIS, which is used to regulate excess liquidity, causes a decrease in the rate of economic growth because liquidity is not channeled to the real sector (Madani & Widiastuti, 2021).

Bank Indonesia Sukuk is a Sharia Monetary Operation instrument used by Bank Indonesia to absorb rupiah liquidity (Bank Indonesia, 2023). The increase in yields at SukBI causes a decrease in liquidity from Islamic banking, which reduces the financing capacity of Islamic banking and decreases economic growth. Conversely, a decrease in yields at SukBI causes an increase in liquidity from Islamic banking, which then increases the financing capacity of Islamic banks and economic growth.

The Bank Indonesia Sharia Deposit Facility (FASBIS) is one of the Sharia monetary instruments used by Bank Indonesia to place excess banking liquidity and as a means of placing short-term funds for Islamic banking (Juhro, 2020). When Bank Indonesia increases the FASBIS yield, its deposit facility will increase, and Islamic banking liquidity will decrease, which will then have an impact on reducing economic growth. On the other hand, when Bank Indonesia reduces FASBIS yields, Bank Indonesia's deposit facilities will decrease, and Islamic banking liquidity will increase, which will then have an impact on increasing economic growth. Thus, the amount of FASBIS has a negative effect on economic growth.

The increase in yields on the Sharia Interbank Money Market (PUAS) causes a decrease in liquidity from Islamic banking, which then reduces the financing capacity of Islamic banking and economic growth. On the other hand, a decrease in yields on PUAS causes an increase in liquidity from Islamic banking, which then increases the financing capacity of Islamic banks and economic growth (Madani & Widiastuti, 2021). Thus, the amount of PUAS funds has a negative effect on economic growth.

Sharia Bank financing is distributed to the community to finance business activities in the real sector, resulting in an increase in community productivity by increasing the production of products and services, increasing community income, and subsequently increasing economic growth. An increase in total Sharia bank financing increases the rate of economic growth because increasing financing distribution will lead to an increase in community productivity and business activities in the real sector in producing goods and services (Madani & Widiastuti, 2021).

The increase in SBIS yields carried out by Bank Indonesia resulted in banks tending to place excess liquidity in SBIS. This can happen because the increase in SBIS yields makes banks more interested in saving their capital in Bank Indonesia rather than channeling their funds into financing (Bawono, 2021). Bank Indonesia Sukuk is also used by Bank Indonesia to absorb rupiah liquidity and reduce the amount of money in circulation. This decrease in money supply results in a decrease in the inflation rate (Bayuni & Siswanto, 2014).

FASBIS is a Sharia monetary instrument from Bank Indonesia intended to absorb rupiah liquidity by accepting the placement of rupiah funds from Sharia Standing Facilities participants in the form of Sharia Commercial Banks (BUS) and Sharia Business Units (UUS) (Bank Indonesia, 2023). The absorption of rupiah liquidity through FASBIS is expected to reduce money supply. One of the causes of inflation is that the money supply is too high. Therefore, FASBIS is expected to reduce the impact of inflation by reducing the money supply.

Financing with PUAS increases deposits and banking credit, which in turn increases investment and aggregate output. This increase is expected to reduce the inflation rate by increasing production levels, which then leads to an increase in the supply of goods. Therefore, the influence of PUAS on inflation is unidirectional (negative) (Andarini & Widiastuti, 2016). This is in line with research by Sudarsono (2017) and Bawono (2021), which shows the negative influence of PUAS on inflation.

The community can use Islamic bank financing distribution to increase productivity by financing business activities in the real sector, which then increases the production of goods and services (Madani & Widiastuti, 2021). This increase in production is expected to increase the supply of goods and reduce inflation rates (Andarini & Widiastuti, 2016). In addition, Islamic bank financing plays a role in growth in the real sector through profit-sharing cooperation agreements (*mudharabah*) (Wibowo & Mubarok, 2017). Based on this statement, we hypothesize that Islamic bank financing has a negative effect on inflation.

Hypotheses

H$_1$: Open-market operation/OPT (LN_OPT) has a negative effect on Indonesia's economic growth.
H$_2$: Sharia Deposit Facility/FASBIS (LN_FASBIS) negatively affects Indonesia's economic growth.
H$_3$: The Sharia Interbank Money Market (LN_PUAS) has a negative effect on Indonesia's economic growth.
H$_4$: Islamic Bank Financing (LN_AF) has a positive effect on Indonesian Economic Growth.
H$_5$: Open-market operation/OPT (LN_OPT) has a negative effect on inflation.

H₆: The Sharia Deposit Facility/FASBIS (LN_FASBIS) has a negative effect on inflation.
H₇: The Sharia Interbank Money Market/PUAS (LN_PUAS) has a negative effect on inflation.
H₈: Islamic Bank Financing (LN_AF) negatively affects inflation.

Research Methods

This study uses secondary data, namely data that have been processed by a second party, in the form of time-series data. The time-series data used in this study were monthly data from January 2017 to December 2022. The independent variables used in this research are related to the transmission of Sharia monetary policy, namely Open Market Operations (SBIS & SukBI), FASBIS, PUAS, and Islamic Bank Financing, with the dependent variable in the form of the Industrial Production Index (IPI) as a proxy for economic growth and inflation. Data were obtained from the Central Bureau of Statistics, Indonesian financial statistics (Bank Indonesia) and Islamic banking statistics of Indonesia (Financial Service Authority).

Descriptive and inferential methods were used in this study. The use of descriptive analysis in this research provides a general picture of the development of the variables used in the research. The inferential analysis in this study uses the Vector Error Correction Model (VECM). VECM is a derivative model of VAR. VECM is used if all the variables studied are stationary in the first derivative and are cointegrated). This model has the advantage of a simple estimation process because it does not need to separate independent and dependent variables and uses the ordinary least squares (OLS) method. In addition, in the VECM there is Impulse Response Function (IRF) and Forecast Error Variance Decomposition (FEVD) analyses are performed. IRF analysis is useful for determining the impact of shocks from one variable on other variables, whereas FEVD analysis is useful for determining the contribution of each independent variable to the dependent variable (Basuki & Prawoto, 2017). In this study, the VECM method is used to show the influence of Sharia monetary policy instrument variables and Islamic Bank financing on economic growth and inflation. This analysis was performed using Eviews 12 and Microsoft Excel 2019.

The model used in this research can be written as follows:

$$\Delta LN\_IPI_t = \alpha + \sum_{i=1}^{p}\beta_{1i}\,\Delta LN\_OPT_{t-i} + + \sum_{i=1}^{p}\beta_{3i}\,\Delta LN\_FASBIS_{t-i} +$$
$$\sum_{i=1}^{p}\beta_{4i}\,\Delta LN\_PUAS_{t-i} + \sum_{i=1}^{p}\beta_{5i}\,\Delta LN\_AF_{t-i} + \gamma D\_COV \qquad (1)$$

$$\Delta INF_t = \alpha + \sum_{i=1}^{p}\beta_{1i}\,\Delta LN_{OPT\,t-i} + \sum_{i=1}^{p}\beta_{2i}\,\Delta LN_{FASBIS\,t-i} + \sum_{i=1}^{p}\beta_{3i}\,\Delta LN\_PUAS_{t-i} +$$
$$\sum_{i=1}^{p}\beta_{5i}\,\Delta LN\_AF_{t-i} + \gamma D\_COV \qquad (2)$$

Explanation:
LN_IPI : Industrial Production Index (index)
INF : Inflation rate (percentage)
LN_OPT : Natural logarithm of Bank Indonesia Sharia Certificates and Sukuk Bank Indonesia (rupiah)
LN_FASBIS : Natural logarithm of Bank Indonesia Sharia Deposit Facility (rupiah)
LN_PUAS : Natural logarithm of Sharia Interbank Money Market (rupiah)
LN_AF : Natural logarithm of Islamic Bank Financing (rupiah)
D_COV : Covid-19 pandemic(dummy)
i,p : Lag length

Results and Discussion

Stationarity Test

The stationarity test aims to avoid spurious regression problems in the model estimation. The stationarity test in this study uses the Augmented Dickey-Fuller (ADF) unit root test method. If the ADF statistical value is smaller than the critical value, the data can be said to be stationary. Study This use mark a critical five percent. If the data are not stationary at the level, testing must be repeated at the level of first difference. The results of this test are listed in Table 1.

Table 1. Data Stationarity Test Results

Variable	Level	ADF-statistics	*MacKinnon Critical Value*	Information
LN_IPI	*Levels*	-4.634594	-2.902953	Stationary
	First- Difference	-8.676191	-2.904198	Stationary
INF	*Levels*	-2.047391	-2.904848	Not Stationary
	First- Difference	-7.594201	-2.903566	Stationary
LN_OPT	*Levels*	-0.982921	-2.902953	Not Stationary
	First- Difference	-8.107140	-2.903566	Stationary
LN_FASBIS	*Levels*	-6.288210	-2.902953	Stationary
	First- Difference	-9.906104	-2.904198	Stationary
LN_PUAS	*Levels*	-5.702037	-2.902953	Stationary
	First- Difference	-10.15060	-2.904198	Stationary
LN_AF	*Levels*	-0.143979	-2.902953	Not Stationary
	First- Difference	-3.313589	-2.904848	Stationary

Testing using ADF revealed that three variables are stationary at level: Index Production Industry (LN_IPI), Bank Indonesia Sharia Deposit Facility (LN_FASBIS), and Sharia Interbank Money Market (LN_PUAS). Meanwhile, the three variables are stationary in the first difference: inflation (LN_INF), open market operations (LN_OPT), and Islamic bank financing (LN_AF).

Determination of Optimal Lag

Determination of the optimal lag aims to determine how long the variable reacts to another variable as well as to prevent autocorrelation in the model. Determination of optimal lag This study uses the minimum Akaike Information Criterion (AIC). The optimal lag test results for the growth model economy are presented in Table 2. These results show that the optimal lag in the economic growth model is lag two. The optimal lag of the two can be interpreted as the incident moment. This was influenced by the events of the two previous periods.

Table 2. Results of the optimal lag test of the Economic Growth Model

Lag	LogL	L.R	FPE	AIC	S.C	HQ
0	208.7920	NA	1.52e-09	-6.1167	-5.7822*	-5.9847
1	245.4594	65.4372	1.06e-09	-6.4757	-5.3048	-6.0137*
2	280.4029	56,985*	7.97e-10*	-6.7816*	-4.7745	-5.9897
3	293.1355	18.8050	1.21e-09	-6.4042	-3.5607	-5.2823
4	320.0532	35.6142	1.23e-09	-6.4632	-2.7834	-5.0113
5	339.6993	22.9708	1.65e-09	-6.2984	-1.7824	-4.5166
6	365.2451	25.9388	1.99e-09	-6.3152	-0.9629	-4.2034

Note: the sign (*) indicates the optimal *lag*

Table 3 presents the lag test results for the inflation model. These results show that the optimal lag for the inflation model is also lag two.

Table 3. Optimal lag test results of the Inflation model

Lag	LogL	L.R	FPE	AIC	S.C	HQ
0	115.1722	NA	2.71e-08	-3.2361	-2.9015*	-3.1041
1	152.7671	67.0924	1.84e-08	-3.6236	-2.4528	-3.1616*
2	183.5947	50.2728	1.57e-08*	-3.8029*	-1.7958	-3,011
3	201.3058	26.1578	2.04e-08	-3.5786	-0.7352	-2.4567
4	231.1905	39.5398*	1.90e-08	-3.7289	-0.0492	-2.2770
5	249.3063	21.1816	2.67e-08	-3.5171	0.9989	-1.7352
6	281.0379	32.2197	2.65e-08	-3.7242	1.6281	-1.6124

Note: the sign (*) indicates the optimal *lag*

VAR Stability Test

Next, stability testing was carried out on the two VAR models with an optimal lag of two. The stability of the VAR model must be tested so that the analysis results from the Impulse Response Function (IRF) and Forecast Error Variance Decomposition (FEVD) become valid. The VAR model can be said to be stable if all modulus values of the roots of the characteristic polynomials are less than one.

Table 4. VAR Stability Test Results

Economic Growth Model		Inflation Model	
Root	Modulus	Root	Modulus
-0.395758 − 0.684416i	0.790601	-0.388934 − 0.687908i	0.790245
-0.395758 + 0.684416i	0.790601	-0.388934 + 0.687908i	0.790245
0.167007 − 0.569602i	0.593580	0.117037 − 0.577979i	0.589710
0.167007 + 0.569602i	0.593580	0.117037 + 0.577979i	0.589710
-0.432384 − 0.386479i	0.579932	0.492877 − 0.163434i	0.519267
-0.432384 + 0.386479i	0.579932	0.492877 + 0.163434i	0.519267
0.566842	0.566842	-0.399571 − 0.305755i	0.503134
-0.129064 − 0.445409i	0.463732	-0.399571 + 0.305755i	0.463732
-0.129064 + 0.445409i	0.463732	-0.404893 − 0.114011i	0.420639
-0.462035	0.462035	-0.404893 + 0.114011i	0.420639

Table 4 lists the modulus values of the roots of these characteristics. The polynomial in the Economic Growth model ranges from 0.462035 to 0.790601. These results show that all the modulus values of the roots of the characteristic polynomial are less than one; therefore, the model can be said to be stable. The inflation model also stabilized, as shown by the modulus values of the roots of the characteristics. The polynomial in the inflation model is less than one, that is, in the range of 0.420638–0.790245.

Cointegration Test

A cointegration test can be performed if all the variables are stationary at the first difference. The cointegration test aims to determine whether variables have a long-term relationship. The Johansen Cointegration Test was used to conduct the cointegration test in this study. The test was performed by comparing trace statistics with a critical value of five percent. The model is said to be cointegrated if the trace statistic is greater than a critical value. If the model contains cointegration, the analysis continues using the Vector Error Correction Model (VECM). Table 5 shows that there is one cointegration equation in the economic growth and inflation model. Because there are cointegrated equations, the economic growth and inflation model is analyzed using the VECM.

Table 5. Cointegration Test Results

Equation Model	Hypothesized No. of CE(s)	Eigenvalues	Trace Statistics	0.05 Critical Value	Prob .**
Economic Growth	None *	0.383424	74.94226	69.81889	0.0184
	At most 1	0.253101	41.57569	47.85613	0.1710
	At most 2	0.162017	21.43977	29.79707	0.3308
	At most 3	0.125048	9.243496	15.49471	0.3433
	At most 4	0.000377	0.026028	3.841465	0.8718
Inflation	None *	0.390691	70.34420	69.81889	0.0454
	At most 1	0.243719	36.15950	47.85613	0.3884
	At most 2	0.149937	16.88488	29.79707	0.6486
	At most 3	0.071229	5.676214	15.49471	0.7334
	At most 4	0.008336	0.577607	3.841465	0.4473

Note: The sign (*) indicates the presence of cointegration at a real level of five percent

VECM test

With the VECM method, the short- and long-term relationships between variables can be identified. The independent variables used in this study are SBIS and SukBI (OMO/OPT), Bank Indonesia Sharia Deposit Facility (FASBIS), Sharia Interbank Money Market (PUAS), and Islamic Bank Financing (AF). The dependent variable in this study is the Industrial Production Index (IPI), which is a proxy for economic growth and inflation (INF). A variable is declared significant or has an influence on other variables if |t-statistic| > t table. The critical value or real level used is five percent. The number of degrees of freedom used in this research was 67, which was obtained by reducing the number of observations (n = 72) and the number of research variables (k = 5). Based on the real level and degrees-of-freedom values, the t-table value in this study was 1.996008.

Table 6. VECM Estimation Results for Economic Growth Model

Variable	Short-term	
	Coefficient	t-statistics
CointEq1	-0.362754	-3.19521*
D(LN_IPI(-1))	-0.115138	-0.81221
D(LN_IPI(-2))	-0.091581	-0.70625
D(LN_OPT(-1))	0.064844	1.03523
D(LN_OPT (-2))	-0.092038	-1.49026
D(LN_FASBIS(-1))	-0.067821	-1.99881*
D(LN_FASBIS(-2))	-0.072442	-2.44441*
D(LN_PUAS(-1))	0.029820	2.97505*
D(LN_PUAS(-2))	0.015343	1.86496
D(LN_AF(-1))	0.104381	0.12774
D(LN_AF(-2))	0.253921	0.28950
D_COV	-0.068266	-2.62344*

Variable	Long-term	
	Coefficient	t-statistics
LN_OPT(-1)	0.053036	0.97908
LN_FASBIS(-1)	-0.285497	-4.08982*
LN_PUAS(-1)	0.067869	3.32292*
LN_AF(-1)	-0.901153	-4.68736*

Note: the sign (*) is significant at the five percent significance level

Table 6 presents the estimation results of the economic growth model. These results show that the CointEq1 variable, which describes adjustments from the short term to the long term, is statistically significant, with a coefficient value of -0.362754. These results can be interpreted as each error being corrected at approximately 0.362754 months. In the short-term, these three variables have a significant effect on economic growth. This variable is FASBIS, both in the previous period and in the two previous periods, both of which had a significant negative influence on economic growth. The Bank Indonesia Sharia Savings Facility (FASBIS) is one of the Sharia monetary instruments used by Bank Indonesia to place excess banking liquidity and as a means of placing short-term funds for Sharia banking (Juhro, 2020). If banking funds stored in the FASBIS increase, they will have an impact on reducing economic growth. The second variable was PUAS in the previous period, which had a significantly positive influence on economic growth. This can occur because excess funds from Islamic banks become more productive if they are placed in the PUAS (Madani & Widiastuti, 2021). The final variable is the pandemic period dummy variable (D_COV), which has a significantly negative effect on economic growth. In the short and long terms, only the OPT/OMO variable does not have a significant effect on economic growth. This is because the FASBIS and SBIS variables, which are instruments for open market operations, are interchangeable (Herianingrum & Fathy, 2016).

Table 7. VECM Estimation Results for the Inflation Model

Variable	Short-term	
	Coefficient	t-statistics
CointEq1	-0.017638	-0.90072
D(INF(-1))	0.081529	0.58399
D(INF(-2))	0.148571	1.05542
D(LN_OPT(-1))	0.209463	0.62079
D(LN_OPT (-2))	0.070578	0.21026
D(LN_FASBIS(-1))	-0.276263	-1.34550
D(LN_FASBIS(-2))	-0.348627	-2.11888*
D(LN_PUAS(-1))	0.051260	0.94416
D(LN_PUAS(-2))	0.038741	0.9312
D(LN_AF(-1))	5.241719	1.21725
D(LN_AF(-2))	0.240937	0.05210
D_COV	0.012607	0.11893
Variable	Long-term	
	Coefficient	t-statistics
LN_OPT(-1)	2.218715	1.38507
LN_FASBIS(-1)	-10.66694	-5.12734*
LN_PUAS(-1)	2.359207	3.85651*
LN_AF(-1)	-22.63734	-4.02616*

Note: the sign (*) is significant at the five percent significance level

The VECM estimation was also performed on the inflation model. In the inflation model, there is no adjustment mechanism from the short term to the long term, as shown through the variable Cointeq1, which is not significant. In the short term, only the FASBIS variable in the two previous periods is significant for inflation. In the long term, the OMO variable alone does not have a significant effect on inflation. To observe the dynamic movement of the VECM model, impulse response functions and forecast error variance decomposition can be used because VECM estimation is less able to explain dynamic movements. The Impulse Response Function is used to detect the response of endogenous variables to shocks to other variables, and to show the time period of the influence of a shock to one variable on other variables. Variance Decomposition is used to estimate the percentage contribution of variance from each variable owing to shocks from a variable (Widarjono, 2007).

Impulse Response Function (IRF)

In the first, second, and third months, IPI gives a positive response to IPI shock. In the fourth to fourteenth months, IPI shock causes a fluctuating increase in the IPI by the IPI itself. The IPI's response to this shock begins to reach long-term equilibrium in the 15th month.

Economic Growth Model   Inflation Model
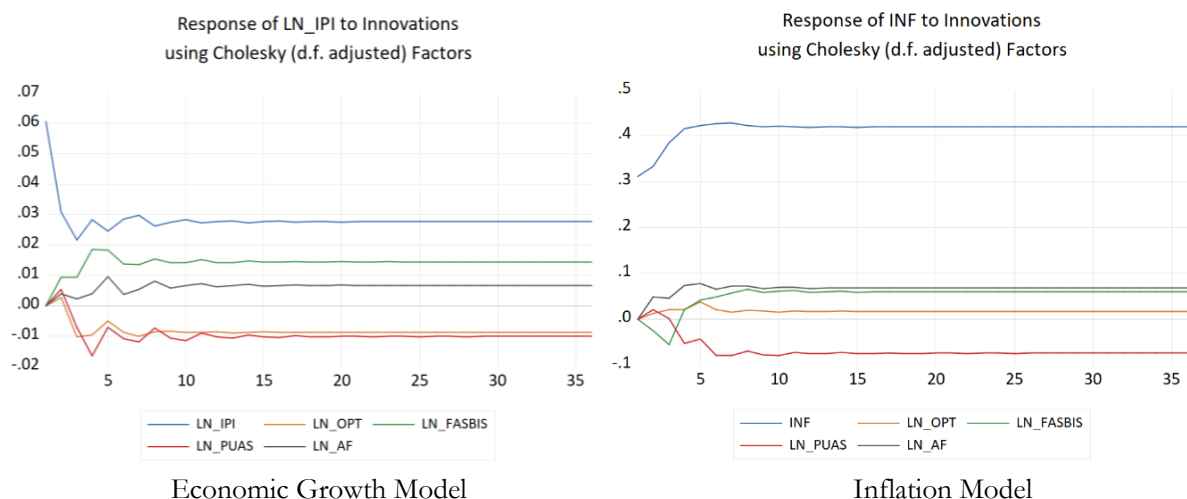
Figure 3. IRF Results

In the first month, the IPI did not respond to the OMO shock. In the second month, IPI responded positively to the shock to the OMO. However, from the third month until the projection for the next three years (36 months), the IPI responded negatively to this shock. The IPI's response to these shocks began to reach long-term equilibrium in the following months 19th.

These results show that, in general, shocks to the OMO variable respond negatively to IPI. This is consistent with the findings of Imaduddin (2019), Syapriatama (2017), and Wibowo and Mubarok (2018). Islamic banking is more interested in placing its funds in Bank Indonesia if the SBIS tends to be high, so there is no need to channel funds through financing to customers (Rusydiana, 2009). Furthermore, liquidity is not channeled to the real sector because of the increase in SBIS, which is used to absorb excess liquidity (Madani & Widiastuti, 2021). Therefore, to increase economic growth, Bank Indonesia needs to reduce the issuance of SBIS and SukBI, because they are used as liquidity absorbers so that more financing can be distributed.

In the first month, IPI did not respond to the FASBIS shock. In the second month, the IPI began to respond positively to shocks to FASBIS. The positive response continued to increase and then began to decline in the fifth to seventh month. In the eighth to 20th month, the increase in FASBIS experienced fluctuations. The IPI's response to this shock began to reach long-term equilibrium in the 21st month.

These results show that, in general, shocks to the FASBIS variable respond positively to economic growth. The SBIS and FASBIS variables have a substitute nature, where SBIS has a lower level of liquidity but higher returns, whereas FASBIS is liquid but with a lower level of return (Herianingrum & Fathy, 2016). The interaction of these two instruments has an impact on Islamic banking liquidity and the banking intermediation function, especially financing. Furthermore, the distribution of financing from banks further impacts the real sector.

In the first month, the IPI did not respond to the shock of PUAS. In the second month, the IPI began to respond positively to the PUAS shocks of 0.0053 percent. However, in the third month of the projection for the next three years (36 months), the IPI responded negatively to this shock. The IPI's response to this shock began to reach long-term equilibrium in the 27th month.

These results show that, in general, the PUAS variable is generally responded to negatively affected by IPI. This is in line with the previous hypotheses and research conducted by Imaduddin (2019) and Zaelina (2018). A characteristic of PUAS is that it is a liquidity instrument for Islamic banking. Islamic banking places funds in PUAS instruments to maximize its portfolio, so Islamic banks do not need to channel funds for financing if PUAS returns are high (Wibowo & Mubarok, 2017)

In the first month, IPI did not respond to the shock to Islamic Bank Financing. In the second month, it began to appear the IPI continued to provide a positive response to Islamic Bank financing shocks over the long term (36 months). The IPI's response to Islamic Bank Financing shocks began to reach its long-term balance in the 23rd month.

These results show that economic growth generally responds to positive shocks from Islamic Bank financing. This is in line with previous hypotheses and research conducted by Imaduddin (2019), Zaelina (2018), and Wibowo and Mubarok (2019). Increasing the distribution of financing to the community will increase community productivity by increasing the activities in the real sector in terms of producing goods and services, which will increase the rate of economic growth (Madani & Widiastuti, 2021).

In the first month, inflation responds positively to inflation. In the second month, the positive response to inflation continues to increase until the seventh month. The long-term balance of these responses was reached by the eighth month.

In the first month, the OMO shock did not respond to inflation. In the second month, inflation began to respond positively to the OMO shocks. This positive response continued to increase until the fifth month of treatment. The positive response to OMO began to decline in the sixth month of life. In the seventh to 19th months, the inflation rate fluctuated. The inflation response to this shock begins to reach long-run equilibrium in the 20th month.

These results show that in general, the OMO variable responds positively to inflation. This is contrary to the previous hypothesis, which states that OMO has a negative effect on inflation.

Islamic banks choose to keep their funds in BI through OMO instruments, such as SBIS and BI Sukuk, because they are considered more profitable than channeling their funds to the public through financing. Passive income and the allocation of funds through these instruments are greater, causing the distribution of funds to the community through financing to tend to decrease, and the acceleration of funding in business activities in the real sector to be small, which then has a low impact on the inflation rate (Sudarsono, 2017).

In the first month, the shock to FASBIS did not respond to inflation. In the second month, inflation responded negatively to shocks at the FASBIS. However, in the fourth month of the projection for the next three years (36 months), inflation responds positively to this shock. The inflation response to the FASBIS shocks begins to reach long-run equilibrium in the 18th month.

These results show that, in general, inflation responded positively to FASBIS shocks, but had a negative response at the beginning of the period. This is contrary to the previous hypothesis, which states that FASBIS has a negative effect on inflation. This situation occurs because FASBIS has a relatively short time period, namely 1-14 days (Citra & Suman, 2022). Therefore, the impact of FASBIS as a liquidity-absorbing instrument was only visible at the beginning of this period.

In the first month, inflation had not yet responded to the shock to inflation. Inflation showed a positive response in the second month. The inflation response became negative in the fourth month and continued for the next three years. The inflation response to this shock begins to reach long-run equilibrium in the 18th month.

These results show that, in general, PUAS shocks respond negatively to inflation rates. These results are in line with the hypotheses and previous research by Sudarsono (2017) and Zaelina (2018). Research conducted by Rusydiana (2009) states that PUAS has a negative influence on Sharia financing. Islamic banking uses PUAS as an alternative to meet its liquidity needs through Sharia repo transactions or selling Sharia securities with a repurchase agreement (Sudarsono, 2017). The use of these instruments by Islamic banking causes a reduction in the financing distributed to the public, which then reduces the amount of money in circulation and subsequently reduces the inflation rate (Nuruliya, 2020).

During the first month, the shock to Islamic Bank Financing did not respond to inflation. Inflation showed a positive response in the second month and then decreased in the third month. After this period, the positive response to inflation continues until the fifth month. The inflation response to Islamic Bank Financing shocks began to reach long-term equilibrium in the 16th period.

These results show that, in general, Islamic Bank Financing shocks respond positively to inflation. This is contrary to the previous hypothesis that Islamic Bank Financing has a negative effect on inflation. A situation in which income increases, which increases people's ability to spend time on goods and services, can also be interpreted as inflation (Sudarsono, 2017). The increasing level of public consumption makes Islamic banks strive to provide financing that is consumptive and productive to obtain maximum income. This financing also increases people's ability to spend on goods and services in a sustainable manner.

Forecast Error Variance Decomposition (FEVD)

FEVD analysis is useful for explaining the contribution of each variable to the main variables observed through the shock. From this statement, it can be inferred that FEVD can explain the proportion of variability in the main research variables. The FEVD in this research will discuss how big the shock contribution of the Sharia monetary policy instrument variables is Open Market Operations (LN_OPT), Bank Indonesia Sharia Deposit Facility (LN_FASBIS), Sharia Interbank Money Market (LN_PUAS), and Islamic Bank Financing (LN_AF) in influencing economic growth and inflation. The period used in the FEVD analysis was 36 months (3 years).

Figure 4 shows the FEVD using the IPI as a proxy for Indonesia's economic growth. In the first month, it can be seen that IPI is influenced by IPI itself by 100 percent. However, from the second to the 36th month, the variables of Sharia monetary policy instruments and Islamic Bank financing began to influence the IPI.
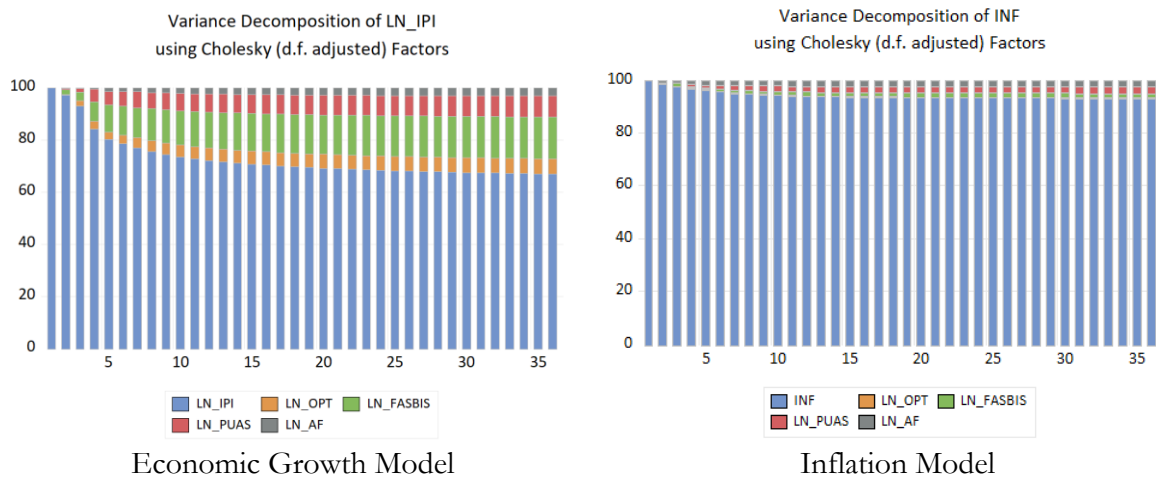
Figure 4. FEVD Results

Until the final period, namely three years (36 months), the IPI variable was still the variable that dominated the contribution from IPI fluctuations, but with a large contribution that decreased to 66.87 percent. Another variable that had the highest contribution in explaining IPI fluctuations was FASBIS, which had a larger contribution (16.04%). The next most influential variables in sequence are the PUAS, Open Market Operations, and Islamic Bank Financing variables, with large percentages of 8.02 percent, 5.82 percent, and 3.24 percent, respectively.

The results of the economic growth model analysis show that the variables that contribute most to explaining fluctuations in the level of economic growth are FASBIS, PUAS, Open Market Operations, and Islamic Bank Financing. These results are similar to those of previous research conducted by Zaelina (2018) and Madani and Widiastuti (2021), where the PUAS variable was one of the variables with the largest contribution, and the Islamic Bank Financing variable had the smallest contribution. These results show that all independent variables contribute to economic growth.

In the first month of the inflation model, it can be seen that inflation was influenced by inflation itself by 100 percent. The variables of Sharia monetary policy instruments and Islamic Bank financing only started to influence the IPI in the second to 36th months.

Until the final period, namely three years (36 months), the inflation variable was still the variable that dominated the contribution from fluctuations in the inflation rate, but with the contribution decreasing to 93 percent. Another variable that had the highest contribution in explaining IPI fluctuations was PUAS, with a larger contribution (2.72%). The next most influential variables are Islamic Bank Financing, FASBIS, and Open Market Operations, with large percentages of 2.39 percent, 1.71 percent, and 2.72 percent, respectively.

The results of the inflation model analysis show that PUAS, Islamic Bank Financing, FASBIS, and Open Market Operations are the variables that contribute most to sequentially explaining fluctuations in inflation. These results are similar to those of previous research conducted by Zaelina (2018) and Sudarsono (2017), where the PUAS and Islamic Bank Financing variables were the independent variables with the largest contribution. These results show that all the independent variables contribute to inflation.

Conclusion

Based on the results of the research analysis and discussion, the conclusion obtained is that in the Economic Growth Model, the VECM estimation results show that there is an adjustment mechanism from the short to the long term. In the short term, FASBIS, the Covid-19 pandemic, and PUAS have had a significant impact on economic growth. In the long term, only the Open Market Operation variable was not significant for economic growth. In general, the results of the IRF analysis show that IPI responded negatively to the OMO and PUAS shocks, while IPI responded positively to the FASBIS and Islamic Bank Financing shocks. The FEVD analysis shows that FASBIS, PUAS, Open

Market Operations, and Islamic Bank Financing are the variables that contribute most to explaining fluctuations in economic growth levels. These results show that FASBIS and Islamic Bank Financing are effective in encouraging economic growth, as can be seen from the IRF analysis, which shows that IPI responds positively to shocks from FASBIS and Islamic Bank Financing.

In the Inflation Model, the VECM results show that there is no adjustment mechanism from the short to the long term. Only the FASBIS variable in the two previous periods is significant for inflation. In the long term, the OMO variable alone does not have a significant effect on inflation. In general, the results of the IRF analysis show that OMO, FASBIS, and Islamic Bank Financing shocks respond positively to the inflation rate, whereas PUAS shocks respond negatively to inflation. The FEVD analysis shows that the variables that contribute most to explaining inflation fluctuations sequentially are PUAS, Islamic Bank Financing, FASBIS, and Open Market Operations. These results show that PUAS is effective in suppressing inflation, as can be seen from the IRF analysis, which shows that inflation responds negatively to PUAS shocks.

Based on the results of this research, it is hoped that the Government and Bank Indonesia will need to re-evaluate Sharia Open Market Operations, especially the SBIS and BI Sukuk instruments. This is the impact of the estimation results on the Open Market Operation variable, which are not significant, and the IRF results, which are negative in the Economic Growth Model and positive in the Inflation Model, indicating that the Open Market Operation variable actually inhibits economic growth and triggers inflation. In addition, the government must be careful in regulating the volume of transactions in Sharia monetary instruments. This needs to be done because there are instruments that trigger economic growth but increase the inflation rate and suppress the inflation rate but inhibit economic growth and vice versa.

This study analyzes only the influence of Sharia monetary policy instruments on economic growth and inflation. Therefore, further research is expected to compare the influence and effectiveness of conventional and Sharia monetary policy instruments on economic growth and inflation, as well as adding new variables from other monetary transmission channels.

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References

Ali, A., Zulkhibri, M., & Kishwar, T. (2022). Economic output, monetary policy transmission and the role of Islamic banks: Evidence from Pakistan dual banking sistem. *Journal of Islamic Monetary Economics and Finance*, 8(4), 535-550. https://doi.org/10.21098/jimf.v8i4.1486

Aqidah, N.A., Ishak, I., Takdir, T., & Azzahra, M. (2022). Analisis efektivitas transmisi kebijakan moneter melalui instrumen Syariah dan konvensional dalam memengaruhi inflasi di Indonesia. *Owner*, 6(3), 2345–2353. https://doi.org/10.33395/owner.v6i3.990

Ascarya. (2012). Alur transmisi dan efektifitas kebijakan moneter ganda di Indonesia. *Buletin Ekonomi Moneter dan Perbankan. 14*(3), 283–315. https://doi.org/10.21098/bemp.v14i3.360

Badan Pusat Statistik. (2023). *Indeks produksi bulanan industri besar dan sedang.* https://www.bps.go.id/subject/9/industri-besar-dan-%20sedang.html#subjekViewTab5

Badan Pusat Statistik. (2023). *Perkembangan indeks produksi manufaktur 2020.* https://www.bps.go.id/publication/2021/08/18/0fbecb97aae729e237657dc6/perkembangan-indeks-produksi-industri-manufaktur-2020.html

Badan Pusat Statistik. (2023). *Produk domestik bruto (Pengeluaran).* https://www.bps.go.id/subject/169/produk-domestik-bruto--pengeluaran-.html

Bank Indonesia. (2021). *Indonesia raih peringkat pertama Islamic finance country index (IFCI) pada global Islamic finance report 2021.* https://www.bi.go.id/id/publikasi/ruang-media/news-release/Pages/sp_2328321.aspx

Bank Indonesia. (2022). *Data inflasi.* https://www.bi.go.id/id/statistik/indikator/data-inflasi.aspx

Bank Indonesia. (2023). *Operasi moneter.* https://www.bi.go.id/id/fungsi-utama/moneter/operasi-moneter/default.aspx

Bank Indonesia. (2023). *Posisi operasi moneter dan transaksi pasar uang.* https://www.bi.go.id/id/statistik/ekonomi-keuangan/seki/Default.aspx#headingOne

Basuki, A. T., & Prawoto, N. (2017). *Analisis regresi dalam penelitian ekonomi dan bisnis*, Rajawali Pers.

Bernanke, B. S., & Gertler, M. (1995). Inside the black box: The credit channel of monetary policy transmission. *Journal of Economic perspectives*, *9*(4), 27-48. https://doi.org/10.1257/jep.9.4.27

Caporale, G. M., Çatık, A. N., Helmi, M. H., Ali, F. M., & Tajik, M. (2020). The bank lending channel in the Malaysian Islamic and conventional banking system. *Global Finance Journal*, 45, 100478. https://doi.org/10.1016/j.gfj.2019.100478

Citra, G.K., & Suman, A. (2022). Analisis determinan yang mempengaruhi pembiayaan bank Syariah di Indonesia pada periode 2016-2020. *Jurnal Syarikah: Jurnal Ekonomi Islam.* 8(2), 185-196. https://doi.org/10.30997/jsei.v8i2.6197

Data Indonesia. (2021). *Keuangan Syariah Indonesia terbaik kedua di dunia pada 2021.* https://dataindonesia.id/ekonomi/detail/keuangan-syariah-indonesia-terbaik-kedua-di-dunia-pada-2021

Dwihapsari, R., Kurniaputri, M.R., & Huda, N. (2021). Analisis efektivitas kebijakan moneter dalam perspektif konvensional dan Syariah terhadap inflasi di Indonesia tahun 2013-2020. *Jurnal Ilmiah Ekonomi Islam. 7*(2). https://doi.org/10.29040/jiei.v7i2.2368

Goldstein, I., Koijen, R. S., & Mueller, H. M. (2021). Covid-19 and its impact on financial markets and the real economy. *The Review of Financial Studies*, *34*(11), 5135-5148. https://doi.org/10.1093/rfs/hhab085

Hafidh, A.A. (2021). Responses of Islamic banking variables to monetary policy shocks in Indonesia. *Islamic Economic Studies. 8*(2), 174-190. https://doi.org/10.1108/IES-11-2020-0049

Hamza, H., & Saadaoui, Z. (2017). Monetary transmission through the debt financing channel of Islamic banks: Does PSIA play a role?. *Research in International Business and Finance*, *45*, 557-570. https://doi.org/10.1016/j.ribaf.2017.09.004

Handayani, F. A., & Kacaribu, F. N. (2021). Asymmetric transmission of monetary policy to interest rates: Empirical evidence from Indonesia. *Buletin Ekonomi Moneter dan Perbankan*, *24*(1), 119-150. https://doi.org/10.21098/bemp.v24i1.1201

Herianingrum, S., & Fathy, U.M. (2016). Analisis mekanisme transmisi moneter jalur pembiayaan bagi hasil di Indonesia. *Jurnal Ekonomi dan Bisnis Islam*, *2*(2), 125–148. https://doi.org/10.20473/jebis.v2i2.3143

Imaduddin, M. (2019). Analisis efektivitas transmisi moneter ganda melalui jalur kredit dan pembiayaan terhadap pertumbuhan ekonomi di Indonesia periode 2011-2018. *Journal of Islamic Economics and Philanthropy*, *2*(3), 413-413. https://doi.org/10.21111/jiep.v2i03.3780

Juhro, S.M. (2020). *Pengantar kebanksentralan teori dan kebijakan*. Rajawali Pers

Madani, A., & Widiastuti, T. (2021). The impact of Islamic monetary operations and aggregate financing on economic growth in Indonesia (2010-2020). *Jurnal Ekonomi dan Bisnis Islam | Journal of Islamic Economics and Business*, *7*(2), 185–209. https://doi.org/10.20473/jebis.v7i2.26085

Nuruliya, D. (2020). Analisis komparasi mekanisme transmisi kebijakan moneter konvensional dan syariah saluran harga aset terhadap inflasi di Indonesia. *Jurnal Ilmiah Mahasiswa FEB*, *8*(2), 1-20. https://jimfeb.ub.ac.id/index.php/jimfeb/article/view/6632/5748

Padhan, R., & Prabheesh, K. P. (2021). The economics of Covid-19 pandemic: A survey. *Economic analysis and policy*, *70*, 220-237. https://doi.org/10.1016/j.eap.2021.02.012

Peek, J., & Rosengren, E. S. (2013). *The role of banks in the transmission of monetary policy*. Research Department Public Policy Discussion Papers, (13), 1–30. https://doi.org/10.1093/oxfordhb/9780199640935.013.0010

Rafay, A., & Farid, S. (2019). Islamic banking system: a credit channel of monetary policy – evidence from an emerging economy. *Economic Research, 32*(1), 742-754. https://doi.org/10.1080/1331677X.2019.1579662

Rusydiana, A. S. (2009). Mekanisme transmisi syariah pada sistem moneter ganda di Indonesia. *Buletin Ekonomi Moneter dan Perbankan*, *11*(4), 345-367. https://doi.org/10.21098/bemp.v11i4.345

Sahoo, P., & Ashwani. (2020). Covid-19 and Indian economy: Impact on growth, manufacturing, trade and MSME sector. *Global Business Review*, *21*(5), 1159-1183. https://doi.org/10.1177/0972150920945687

Shah, S. M., & Rashid, A. (2019). The credit supply channel of monetary policy transmission mechanism: An empirical investigation of Islamic banks in Pakistan versus Malaysia. *Journal of Islamic Monetary Economics and Finance*, 5(1), 21-36. https://doi.org/10.21098/jimf.v5i1.1046

Silva, T. C., Tabak, B. M., & Laiz, M. T. (2021). The finance-growth nexus: The role of banks. *Economic Systems*, *45*(1), 1-20. https://doi.org/10.1016/j.ecosys.2020.100762

Sudarsono, H. (2017). Analisis efektifitas transmisi kebijakan moneter konvensional dan syariah dalam mempengaruhi tingkat inflasi. *Jurnal Ekonomi & Keuangan Islam*. *3*(2), 53–64. https://doi.org/10.20885/jeki.vol3.iss2.art1

Swamy, V., & Dharani, M. (2021). Thresholds in finance–growth nexus: Evidence from G-7 economies. *Australian Economic Papers, 60*(1), 1-40. https://doi.org/10.1111/1467-8454.12192

Syapriatama, I. (2017). Transmisi kebijakan moneter jalur pembiayaan bank syariah di Indonesia. *IQTISHADUNA*. *8*(1), 1-11. https://journal.uinmataram.ac.id/index.php/iqtishaduna/article/view/356

Warjiyo, P. (2004). *Mekanisme transmisi kebijakan moneter di Indonesia*, Pusat Pendidikan dan Studi Kebanksentralan (PPSK), Bank Indonesia. https://lib.ibs.ac.id/materi/BI%20Corner/Terbitan%20BI/Seri%20Kebanksentralan/11.%20Mekanisme%20transmisi%20kebijakan%20moneter%20di%20Indonesia.pdf

Warjiyo, P., & Juhro, S. (2019). *Central Bank Policy: Theory and Practice*. Emerald Publishing Limited.

Wei, X., & Han, L. (2021). The impact of Covid-19 pandemic on transmission of monetary policy to financial markets. *International Review of Financial Analysis*, *74*, 101705. https://doi.org/10.1016/j.irfa.2021.101705

Wibowo, M. G., & Mubarok, A. (2017). Analisis efektivitas transmisi moneter ganda terhadap pertumbuhan ekonomi Indonesia. *Jurnal Ekonomi dan Pembangunan*, *25*(2), 127–139. https://doi.org/10.14203/JEP.25.2.2017.127-139

Widarjono, A. (2007). *Ekonometrika teori dan aplikasi untuk ekonomi dan bisnis* (Ed ke-2). Ekonisia.

World Bank. (2022). *Financial deepening for stronger growth and sustainable recovery*. IBRD IDA, World Bank Group, https://openknowledge.worldbank.org/server/api/core/bitstreams/1d693935-3fad-55e1-91f4-3feae60dd23c/content

Zaelina, F. (2018). Mekanisme transmisi kebijakan moneter syariah. *Indonesian Interdisciplinary Journal of Sharia Economics (IIJSE). 1*(1), 19–30. https://doi.org/10.31538/iijse.v1i1.69